Pressure Testing Requirements for Hazardous Liquid Pipelines in California

October 1, 2004 revision

Introduction

To assist hydrostatic testing personnel and pipeline operators in understanding the requirements of the hydrostatic testing provisions of Chapter 5.5 of the California Government Code, the Office of the California State Fire Marshal (CSFM), has developed this Student Manual.

The information contained in this supplement is not new. Reporting procedures contained in this publication merely identify these requirements in a single easy-to-use student manual.

Comments or recommendations concerning this document are welcome and encouraged. Please send your comments to:

CDF/ State Fire Marshal
Pipeline Safety Division
P.O. Box 944246
Sacramento, California 94244-2460

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Excerpts from 49 CFR Part 195.300 to 195.310

Subpart E- Hydrostatic Testing

§195.300 Scope

This subpart prescribes minimum requirements for the pressure testing of steel pipelines. However, this subpart does not apply to the movement of pipe under §195.424.

195.302 General Requirements

(a) Except as otherwise provided in this section and in §195.305(b) , no operator may operate a pipeline unless it has been pressure tested under this subpart without leakage. In addition, no operator may return to service a segment of pipeline that has been replaced, relocated, or otherwise changed until it has been pressure tested under this subpart without leakage.
(b) Except for pipelines converted under §195.5, the following pipelines may be operated without pressure testing under this subpart:

(1) Any hazardous liquid pipeline whose maximum operating pressure is established under §195.406(a)(5) that is-

(i) An interstate pipeline constructed before January 8, 1971;
(ii) An interstate offshore gathering line constructed before August 1, 1977;
(iii) An intrastate pipeline constructed before October 21, 1985; or
(iv) A low-stress pipeline constructed before August 11, 1994, that transports HVL.

(2) Any carbon dioxide pipeline constructed before July 12, 1991, that-

(i) Has its maximum operating pressure established under §195.406(a)(5); or
(ii) Is located in a rural area as part of a production field distribution system.

(3) Any low-stress pipeline constructed before August 11, 1994, that does not transport HVL.

(4) Those portions of older hazardous liquid and carbon dioxide pipelines for which an operator has elected the risk-based alternative under Sec. 195.303 and which are not required to be tested based on the risk-based criteria.

(c) Except for pipelines that transport HVL onshore, low-stress pipelines, and pipelines covered under Sec. 195.303, the following compliance deadlines apply to pipelines under paragraphs (b)(1) and (b)(2)(i) of this section that have not been pressure tested under this subpart:

(1) Before December 7, 1998, for each pipeline each operator shall-
(i) Plan and schedule testing according to this paragraph; or
(ii) Establish the pipelines maximum operating pressure under §195.406(a)(5).

(2) For pipelines scheduled for testing, each operator shall-
(i) Before December 7, 2000, pressure test-

(A) Each pipeline identified by name, symbol, or otherwise that existing records show contains more than 50 percent by mileage of electric resistance welded pipe manufactured before 1970; and
(B) At least 50 percent of the mileage of all other pipelines; and
(ii) Before December 7, 2003, pressure test the remainder of the pipeline mileage.

195.303 Risk-based alternative to pressure testing older hazardous liquid and carbon dioxide pipelines.

(a) An operator may elect to follow a program for testing a pipeline on risk-based criteria as an alternative to the pressure testing in Sec. 195.302(b)(1)(i)-(iii) and Sec. 195.302(b)(2)(i) of this subpart. Appendix B provides guidance on how this program will work. An operator electing such a program shall assign a risk classification to each pipeline segment according to the indicators described in paragraph (b) of this section as follows:
(1) Risk Classification A if the location indicator is ranked as low or medium risk, the product and volume indicators are ranked as low risk, and the probability of failure indicator is ranked as low risk;
(2) Risk Classification C if the location indicator is ranked as high risk; or
(3) Risk Classification B.

(b) An operator shall evaluate each pipeline segment in the program according to the following indicators of risk:

(1) The location indicator is-

(i) High risk if an area is non-rural or environmentally sensitive \1\; or
(ii) Medium risk; or
(iii) Low risk if an area is not high or medium risk.

(2) The product indicator is (See Appendix B-1 , Table 4).

(i) High risk if the product transported is highly toxic or is both highly volatile and flammable;
(ii) Medium risk if the product transported is flammable with a flashpoint of less than 100 deg. F, but not highly volatile; or
(iii) Low risk if the product transported is not high or medium risk.

(3) The volume indicator is-
(i) High risk if the line is at least 18 inches in nominal diameter;
(ii) Medium risk if the line is at least 10 inches, but less than 18 inches, in nominal diameter; or
(iii) Low risk if the line is not high or medium risk.

(4) The probability of failure indicator is-
(i) High risk if the segment has experienced more than three failures in the last 10 years due to time-dependent defects (e.g., corrosion, gouges, or problems developed during manufacture, construction or operation, etc.); or
(ii) Low risk if the segment has experienced three failures or less in the last 10 years due to time-dependent defects.

(c) The program under paragraph (a) of this section shall provide for pressure testing for a segment constructed of electric resistance-welded (ERW) pipe and lapwelded pipe manufactured prior to 1970 susceptible to longitudinal seam failures as determined through paragraph (d) of this section. The timing of such pressure test may be determined based on risk classifications discussed under paragraph (b) of this section. For other segments, the program may provide for use of a magnetic flux leakage or ultrasonic internal inspection survey as an alternative to pressure testing and, in the case of such segments in Risk Classification A, may provide for no additional measures under this subpart.

(d) All pre-1970 ERW pipe and lapwelded pipe is deemed susceptible to longitudinal seam failures unless an engineering analysis shows otherwise. In conducting an engineering analysis an operator must consider the seam-related leak history of the pipe and pipe manufacturing information as available, which may include the pipe steel's mechanical properties, including fracture toughness; the manufacturing process and controls related to seam properties, including whether the ERW process was high-frequency or low-frequency, whether the weld seam was heat treated, whether the seam was inspected, the test pressure and duration during mill hydrotest; the quality control of the steel-making process; and other factors pertinent to seam properties and quality.

(e) Pressure testing done under this section must be conducted in accordance with this subpart. Except for segments in Risk Classification B which are not constructed with pre-1970 ERW pipe, water must be the test medium.
(f) An operator electing to follow a program under paragraph (a) must develop plans that include the method of testing and a schedule for the testing by December 7, 1998. The compliance deadlines for completion of testing are as shown in the table below:

Table. - Sec. 195.303--Test Deadlines Risk

Pipeline segment	Classification	Test deadline
Pre-1970 Pipe susceptible to longitudinal seam failures[defined in Sec. 195.303(c) & (d)].	C or B	12/7/2000.
	A	12/7/2002.
All Other Pipeline Segments	C	12/7/2002.
	B	12/7/2004.
	A	Additional testing not required.

(g) An operator must review the risk classifications for those pipeline segments which have not yet been tested under paragraph (a) of this section or otherwise inspected under paragraph © of this section at intervals not to exceed 15 months. If the risk classification of an untested or uninspected segment changes, an operator must take appropriate action within two years, or establish the maximum operating pressure under Sec. 195.406(a)(5).
(h) An operator must maintain records establishing compliance with this section, including records verifying the risk classifications, the plans and schedule for testing, the conduct of the testing, and the review of the risk classifications.

(i) An operator may discontinue a program under this section only after written notification to the Administrator and approval, if needed, of a schedule for pressure testing.

§195.304 Test Pressure

The test pressure for each pressure test conducted under this subpart must be maintained throughout the part of the system being tested for at least 4 continuous hours at a pressure equal to 125 percent, or more, of the maximum operating pressure and, in the case of a pipeline that is not visually inspected for leakage during test, for at least an additional 4 continuous hours at a pressure equal to 110 percent, or more, of the maximum operating pressure.

§195.305 Testing Components

(a) Each pressure test under §195.302 must test all pipe and attached fittings, including components, unless otherwise permitted by paragraph (b) of this section.
(b) A component, other than pipe, that is the only item being replaced or added to the pipeline system need not be hydrostatically tested under paragraph (a) of this section if the manufacturer certifies that either-

(1) The component was hydrostatically tested at the factory; or

(2) The component was manufactured under a quality control system that ensures each component is at least equal in strength to a prototype that was hydrostatically tested at the factory.

195.306 Test Medium

a) Except as provided in paragraph (b), (c), and (d) of this section, water must be used as the test medium.
(b) Except for offshore pipelines, liquid petroleum that does not vaporize rapidly may be used as the test medium if-

(1) The entire pipeline under test is outside of cities and other populated areas;
(2) Each building within 300 feet of the test section is unoccupied while the test pressure is equal to or greater than a pressure which produces a hoop stress of 50 percent of specified minimum yield strength;
(3) The test section is kept under surveillance by regular patrols during the test; and,
(4) Continuous communication is maintained along entire test section.

(c) Carbon dioxide pipelines may use inert gas or carbon dioxide as the test medium if-

(1) The entire pipeline section under test is outside of cities and other populated areas;
(2) Each building within 300 feet of the test section is unoccupied while the test pressure is equal to or greater than a pressure that produces a hoop stress of 50 percent of specified minimum yield strength;
(3) The maximum hoop stress during the test does not exceed 80 percent of specified minimum yield strength;
(4) Continuous communication is maintained along entire test section; and,

(5) The pipe involved is new pipe having a longitudinal joint factor of 1.00.

(d) Air on inert gas may be used as the test medium in low-stress pipelines.

195.307 Pressure Testing aboveground breakout tanks

(a) For aboveground breakout tanks built to API Specification 12F and first placed in service after October 2, 2000, pneumatic testing must be in accordance with section 5.3 of API Specification 12F.
(b) For aboveground breakout tanks built to API Standard 620 and first placed in service after October 2, 2000, hydrostatic and pneumatic testing must be in accordance with section 5.18 of API Standard 620.

(c) For aboveground breakout tanks built to API Standard 650 and first placed in service after October 2, 2000, hydrostatic and pneumatic testing must be in accordance with section 5.3 of API Standard 650.

(d) For aboveground atmospheric pressure breakout tanks constructed of carbon and low alloy steel, welded or riveted, and non-refrigerated and tanks built to API Standard 650 or its predecessor Standard 12C that are returned to service after October 2, 2000, the necessity for the hydrostatic testing of repair, alteration, and reconstruction is covered in section 10.3 of API Standard 653.
(e) For aboveground breakout tanks built to API Standard 2510 and first placed in service after October 2, 2000, pressure testing must be in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 or 2.

195.308 Testing of tie-ins.

Pipe associated with tie-ins must be pressure tested, either with the section to be tied in or separately.

§195.310 Records

(a) A record must be made of each pressure test required by this subpart, and the record of the latest test must be retained as long as the facility tested is in use.
(b) The record required by paragraph (a) of this section must include:

(1) The pressure recording charts;
(2) Test instrument calibration data;
(3) The name of the operator, the name of the person responsible for making the test, and the name of the test company used, if any;
(4) The date and time of the test;
(5) The minimum test pressure;
(6) The test medium;
(7) A description of the facility tested and the test apparatus;
(8) An explanation of any pressure discontinuities, including test failures, that appear on the pressure recording charts; and,

(9) Where elevation differences in the section under test exceed 100 feet, a profile of the pipeline that shows the elevation and test sites over the entire length of the test section.

Excerpts from the California Government Code
Pertaining to Hydrostatic Testing

§51013.5 Required Testing

(a) Every newly constructed pipeline, existing pipeline, or part of a pipeline system that has been relocated or replaced, and every pipeline that transports a hazardous liquid substance or highly volatile liquid substance, shall be tested in accordance with Subpart E (commencing with Section 195.300) of Part 195 of Title 49 or the Code of Federal Regulations.

(b) *NA*
(c) *NA*

(d) Every pipeline over 10 years of age and provided with effective cathodic protection shall be hydrostatically tested every five years, except for those on the State Fire Marshal's list of higher risk pipelines which shall be hydrostatically tested every two years.

(e) Piping within a refined products bulk loading facility served by pipeline shall be tested hydrostatically at 125 percent of maximum allowable operating pressure utilizing the product ordinarily transported in that pipeline if that piping is operated at a stress level of 20 percent or less of the specified minimum yield strength of the pipe. The frequency for pressure testing these pipelines shall be every five years for those pipelines with effective cathodic protection and every three years for those pipelines without effective cathodic protection. If that piping is observable, visual inspection may be the method of testing.

(e) Beginning on July 1, 1990, and continuing until the regulations adopted by the State Fire Marshal pursuant to subdivision (g) take effect, each pipeline within the State Fire Marshal's jurisdiction which satisfies any of the following sets of criteria shall be placed on the State Fire Marshal's list of higher risk pipelines until five years pass without a reportable leak due to corrosion or defect on that pipeline. Initially, pipelines on that list shall be tested by the next scheduled test date, or within two years of being placed on the list, whichever is first. On July 1, 1990, pipeline operators shall provide the State Fire Marshal with a list of all their pipelines, which satisfy the criteria in this subdivision as of July 1, 1990. If any pipeline become eligible for the list of higher risk pipelines after that date, the pipeline company shall report that fact the State Fire Marshal within 30 days, and the pipeline shall be placed on the list retroactively to the date on which it became eligible for listing. Pipelines, which are found to belong on the list, but are not so reported by the operator to the State Fire Marshal, shall be placed on the list retroactively. Operators failing to properly report their pipelines shall be subject to penalties under Section 51018.6. Pipelines not covered under the risk criteria developed pursuant to subdivision (g) shall be deleted from the list when

(f) regulations are adopted pursuant to that subdivision. For purposes of this subdivision, a leak which is traceable to an external force, but for which corrosion is partly responsible, shall be deemed caused by corrosion, "defect" refers to manufacturing or construction defects, and "leak" or "reportable leak" means a rupture required to be reported pursuant to Section 51018. As long as all pipelines are tested in their entirety at least as frequently as standard risk pipelines under subdivisions (c) and (d), it shall suffice for additional tests on higher risk pipelines to cover 20 pipeline miles in all directions along an operator's pipeline from the position of the leak or leaks which led to the inclusion or retention of that pipeline on the higher risk list. The interim list shall include pipelines, which meet any of the following criteria:

(1) Have suffered two or more reportable leaks, not including leaks during a certified hydrostatic pressure test, due to corrosion or defect in the prior three years;

(2) Have suffered three or more reportable leaks, not including leaks during a certified hydrostatic pressure test, due to corrosion, defects, or external forces, but not all due to external forces, in the prior three years;

(3) Have suffered a reportable leak, except during a certified hydrostatic pressure test, due to corrosion or defect of more than 50,000 gallons, or 10,000 gallons in a standard metropolitan statistical area, in the prior three years; or have suffered a leak due to corrosion or defect which the State Fire Marshal finds has resulted in more than 42 gallons of a hazardous liquid within the State Fire Marshal's jurisdiction entering a waterway in the prior three years; or have suffered a reportable leak of a hazardous liquid with a flashpoint of less than 140 degrees Fahrenheit, or 60 degrees centigrade, in the prior three years.

(4) Are less than 50 miles long, and have experienced a reportable leak, except during a certified hydrostatic pressure test, due to corrosion or a defect in the prior three years. For the purposes of this paragraph, the length of a pipeline with more than two termini shall be the longest distance between two termini along the pipeline.

(5) Have experienced a reportable leak in the prior five years due to corrosion or defect, except during a certified hydrostatic pressure test, on a section of pipe more than 50 years old. For pipelines which fall in this category, and no other category of higher risk pipeline, additional tests required by this subdivision shall be required only on segments of the pipe more than 50 years old as long as all pipe more than 50 years old which is within 20 pipeline miles from the leak in all directions along an operator's pipeline is tested.

(g) The State Fire Marshal shall study indicators and precursors of serious pipeline accidents, and, in consultation with the Pipeline Safety Advisory Committee, shall

(h) develop criteria for identifying which hazardous liquid pipelines pose the greatest risk to people and the environment due to the likelihood of, and likely seriousness of, an accident due to corrosion or defect. The study shall give due consideration to research done by the industry, the federal government, academia, and to any other information which the State Fire Marshal shall deem relevant, including, but not limited to, recent leak history, pipeline location, and material transported. Beginning January 1, 1992, using the criteria identified in that study, the State Fire Marshal shall maintain a list of higher risk pipelines, which exceed a standard of risk to be determined by the State Fire Marshal, and which shall be tested as required in subdivisions (c) and (d) as long as they remain on the list. By January 1, 1992, after public hearings, the State Fire Marshal shall adopt regulations to implement this subdivision.

(h) In addition to the requirements of subdivisions (a) to (e) inclusive, the State Fire Marshal may require any pipeline subject to this chapter to be subjected to a pressure test, or any other test or inspection, at any time, in the interest of public safety.

(i) Test methods other than the hydrostatic tests required by subdivisions (b), (c) (d) and (e), including inspection by instrumented internal inspection devices, may be approved by the State Fire Marshal on an individual basis. If the State Fire Marshal approves an alternative to a pressure test in an individual case, the State Fire Marshal may require that the alternative test be given more frequently than the testing frequencies specified in subdivisions (b), (c) (d) and (e).

(j) The State Fire Marshal shall adopt regulations before January 1, 1992, to establish what the State Fire Marshal deems to be an appropriate frequency for tests and inspections, including instrumented internal inspections, which, when permitted as a substitute for tests required under subdivisions (b), (c) and (d) do not damage pipelines or require them to be shut down for the testing period. That testing shall in no event be less frequent than is required by subdivisions (b), (c) and (d). Each time one of these tests is required on a pipeline, it shall be approved on the same individual basis as under subdivision (i). If it is not approved, a hydrostatic test shall be carried out at the time the alternative test would have been carried out, and subsequent tests shall be carried out in accordance with the time intervals prescribed by subdivision (b), (c) or (d), as applicable.

§51014 Testing procedure pursuant to Section 51013.5; Test pressure

(a) The pressure tests required by subdivisions (b), (c) and (d) of Section 51013.5 shall be conducted in accordance with Subpart E (commencing with Section 195.300) of Part 195 of Title 49 of the Code of Federal Regulations, except that

(b) an additional four-hour leak test, as specified in subsection (c) of Section 195.302 of Title 49 of the Code of Federal Regulations, shall not be required under subdivisions (b), (c) and (d) of Section 51013.5. The State Fire Marshal may authorize the use of liquid petroleum having a flashpoint over 140 degrees Fahrenheit or 60 degrees centigrade as the test medium. The State Fire Marshal shall make these authorizations in writing. Pressure tests performed under subdivisions (b), (c) and (d) of Section 51013.5 shall not show an hourly change for each section of the pipeline under test at the time in excess of either 10 gallons or the sum of one gallon and an amount computed at a rate in gallons per mile equivalent to one-tenth of the nominal internal diameter of the pipe in inches.

(b) Test pressure shall be at least 125 percent of the actual pipeline operating pressure.

§51014.3 Notice to State Fire Marshal prior to hydrostatic test

(a) Each pipeline operator shall notify the State Fire Marshal and the local fire department having fire suppression responsibilities at least three working days prior to conducting a hydrostatic test, which is required by this chapter. The notification shall include all of the following information:

(1) The name, address and telephone number of the pipeline operator.

(2) The specific location of the pipeline section to be tested and the location of the test equipment.

(3) The date and time the test is to be conducted.

(4) An invitation and a telephone number for local fire departments to call for further information on what they should do in event of a leak during testing.

(5) The test medium

(6) The name and telephone number of the independent testing firm or person responsible for certification of the test results.

(b) The State Fire Marshal may observe tests conducted pursuant to this chapter.

§51014.5 Certification and submission of test results

(a) When hydrostatic testing is required by Section 51013.5, the test results shall be certified by an independent testing firm or person who is selected from a list, provided by the State Fire Marshal, of independent testing firms or persons approved annually by the State Fire Marshal. The State Fire Marshal may charge a fee for consideration and approval of an independent testing firm or

person pursuant to this subdivision, not to exceed the reasonable costs of that consideration and approval.

(b) The results of the tests required by Section 51013.5 shall be submitted by the independent testing firm of persons within 30 days after completion of the test to the State Fire Marshal, who may review the results. The report shall show all of the following information:

(1) The date of the test

(2) A description of the pipeline tested including a map of suitable scale showing the route of the pipeline.

(3) The results of the test

(4) Any other test information that may be specifically requested by the State Fire Marshal.

(b) The State Fire Marshal shall not supervise, control or otherwise direct the testing.

Excerpts from Title 19
California Code of Regulations Concerning Hydrostatic Testing

§2040. Fees In order to implement Chapter 5.5 of the Government Code, California Pipeline Safety Act of 1981, the following fees will be assessed on a fiscal year basis:

(a) Intrastate Pipelines
- (1) Pipeline operator $3,000
- (2) Charge per mile of pipeline operated $150
- (3) Independent Hydrostatic Testing Firm $1,500

(b) Interstate Pipelines
- (1) Pipeline Operator $3,000
- (2) Charge per mile of pipeline operated $100

Date of Test

Pipelines which are required to be tested by subdivisions (b), (c) and (d) of Section 51013.5 shall be tested within 90 days after the anniversary date of the last hydro-test. Requests for a waiver to this requirement must be made in writing to the address listed below. Each request will be reviewed on an individual basis and the operator will receive a written response from CSFM.

CDF/ State Fire Marshal
Pipeline Safety Division
3950 Paramount Blvd. #210
Lakewood, California 90712

Notification of Test to the CSFM

It is the responsibility of the *pipeline operator t*o notify the CSFM Pipeline Safety Division by telephoning (562) 497-9100 as appropriate *at least three working days prior to a pressure test date.*

The notification requirement is satisfied only for the date the test is first scheduled and any consecutive days as long the testing process continues. If the testing process is postponed or delayed to a later date, the operator must notify the CSFM and local fire department of the new test date.

Each test will be given a test identification number which must be included with the results of the test.

In an emergency, a notification period of less than three working days may be allowed if approved in advance by CSFM.

Notification of the Local Fire Department

It is the responsibility of the *pipeline operator* to notify the local authority having fire suppression authority *at least three working days prior to each hydrostatic test*.

Method of Testing

Pressure tests performed in compliance with Subdivisions (b), (c), and (d) of Section 51013.5, California Government Code, shall not show an hourly change for each pipeline segment under test in excess of either 10 gallons or the sum of one gallon and an amount computed at a rate in gallons per mile equivalent to one-tenth of the nominal internal diameter of the pipe in inches.

Allowable Hourly Change in Gallons (not to exceed 10 gallons) =

$$1 + [\frac{ID(inches)}{10} X \frac{L(ft)}{5280(ft)}]$$

ID: the internal diameter of the pipe segments.

Hourly Change: that amount of fluid that cannot be accounted for by direct measurement or through temperature/pressure/volume calculations. In other words, after accounting for fluid measurements and temperature change, the amount of unaccounted fluid loss is limited to the above formula.

Measurement of Pressure

A deadweight tester capable of measuring to 1psi increments shall be present during each test. The deadweight may be used either continuously throughout the test or at the beginning and at the end of the test. The deadweight tester shall be calibrated to a standard acceptable to the State Fire Marshal at least once every two years.

REQUIREMENTS:

1. Deadweight pressure readings shall be taken at a minimum of 1 hour increments.

2. A pressure recording chart shall continuously record the pressure on the pipe during the test. The pressure recording chart shall be calibrated prior to every test.

3. Except for pre-tested pipe, a pressure gauge or similar device shall be provided at each end of the test segment to indicate that the entire test segment is pressurized.

Measurement of Temperature

The temperature measuring devices shall be placed so as to provide a representative sample of the pipeline segment under test.

Responsibilities of Independent Hydrostatic Testing Company

The role of the independent hydro-testing testing company's representative is to witness the pressure test for the prescribed time, ascertain the extent of the test, record the necessary data and forward the results to the CSFM.

Section 51014.5, California Government Code requires that each hydrostatic test be certified by an independent testing firm or person approved by CSFM. It does not require nor authorize the testing firm or person to approve the test. *It is the pipeline operators responsibility and decision to verify and certify the test results.*

The name of the hydrostatic testing company's employee approved to witness the testing must be included on the current CSFM list of Approved Hydrostatic Testing Companies.

The witness must be present for the entire required test period. The required test periods are:

Newly constructed pipelines and pipelines where any segment is not entirely visible.....8 hours

Pipelines tested per DOT Integrity Management Program… ..8 hours

Pipelines where each segment under test is entirely visible.....4 hours

Pipelines tested solely for CA Government Code .....4 hours

Pipeline Operator is responsible for determining type of test and length of test.

The independent testing firm shall not witness or certify a test conducted on a pipeline on which they have performed new construction or repair work. This does not prohibit a testing firm or person from certifying test results on a pipeline they previously performed

work on. The requirement is designed to prevent a company from witnessing and/or certifying results for pipeline segments where the company has performed the repair or installation.

Minimum Requirements for Independent Testing Company

1. Determine the extent of the test. Verify that the entire test segment is under test.

2. Account for any fluid added to or drained from the pipeline. If a flange leaks during the test, measurement of the amount must be taken into account.

3. Observe and document the test pressure for the required test period. Record the minimum test pressure observed during the test. (This is critical since the pipelines operating pressure is based on this pressure.)

4. Provide a sketch or drawing or map of the pipeline segment tested.

5. Each witness should be qualified and be familiar with the minimum testing requirements.

6. Any testing inconsistencies should be brought to CSFM's attention immediately.

Test Results

Only the Test results required by CSFM shall be submitted in the format included in Appendix B-2. Test results shall be mailed to:

CDF/ State Fire Marshal
Pipeline Safety Division
3950 Paramount Blvd., Suite 210
Lakewood, California 90712

Facsimile or computer generated reports are also acceptable.

The test results submitted to the CSFM for review must include any calculations made to adjust for changes in volume due to temperature, pressure and elevation changes. Calculations used must represent commonly accepted standards such as those used by the American Petroleum Institute (API), industry or university level engineering courses. The operator may use test calculations provided by the independent testing firms.

If no calculations are provided, CSFM staff will evaluate the test results utilizing a standard formula and constants listed in Appendix C-2.

The CSFM test I.D. number should be placed in the upper right hand corner of every page of the hydrotest paperwork submitted for review. Test results will be reviewed by CSFM to insure the allowable hourly change criteria are met. If a test result is submitted without supporting calculations and shows an hourly loss greater than allowed, the operator must retest the pipeline or provide additional data or calculations.

Pre-tested Pipe

Pre-tested pipe is piping which has been hydrostatically tested prior to installation.

Hydrostatic testing of pre-tested pipe shall be witnessed by a approved representative of a certified independent hydrostatic testing company for a minimum of 4 hours.

The following information shall be marked on the outside of the pre-tested pipe at intervals of approximately five feet:

CSFM Test ID No.
Date of Test
Test Pressure.

Leaks Occurring During Hydrostatic Testing

Except for failures of pre-tested pipe, any leak on a pipeline undergoing a pressure test shall immediately be reported to the local fire department and to the California Office of Emergency Services (OES). The 24-hour emergency telephone number for OES is **1-800-852-7550**.

Except for small leaks on pipe valves or flange gaskets, all leaks occurring on the pipeline as a result of the testing process must be reported to CSFM on the hydrostatic test form. Information must include the location and cause of the failure.

How to Become a CSFM Approved Hydrostatic Testing Company

Section 51014.5, California Government Code, requires that all hydrostatic testing results submitted to the State Fire Marshal must be certified by an independent testing firm or person approved by the State Fire Marshal. Each year, the State Fire Marshal publishes a list of companies and persons who are approved to certify and witness hydrostatic tests for the following fiscal year.

Companies wishing to conduct hydrostatic testing or certify test results must make application to the State Fire Marshal using the form found in the Initial Application Approval as an Independent Hydrostatic Testing Firm form and pay the appropriate fee. Application form is available on SFM website: http://osfm.fire.ca.gov.

Engineering staff will examine the completed application and evaluate the qualifications, experience and training of the applicant's employees. An on-site evaluation will be conducted of the company's business location to determine if adequate equipment is available.

The applicant will be notified in writing of the approval or denial of the application. Approved applicants and their staff will be included on the State Fire Marshal's annual list of Approved Hydrostatic Companies.

Renewal of Annual Hydrostatic Testing Approval

Approved hydrostatic testing companies must submit application for renewal of their approved status to the State Fire Marshal each year. The State Fire Marshal will send each approved company an invoice and renewal form during May. Application and fees must be received prior to the beginning of the fiscal year. Companies who do not renew their approved status in a timely fashion may not be included in the annual publication of the State Fire Marshal's Approved Hydrostatic Testing Company list.

Pressure Tests Using Liquid Petroleum with a Flashpoint Over 140^{o}F as the Test Medium

CSFM may authorize the use of liquid petroleum having a flashpoint over 140^{o}F (60^{o}C) as the test medium. All pressure tests using a liquid petroleum, which exceeds the maximum operating pressure, must be approved by the State Fire Marshal. *This includes tests, which are not required by the California Government Code.*

Note: Testing performed to comply with the DOT Integrity Management Rule must meet the requirements of Part 195.306 Test Medium. A written waiver to use product may be required. This process takes 60-90 days. Plan ahead.

The pipeline operator must apply in writing to:

CDF/State Fire Marshal
Pipeline Safety Division
3950 Paramount Blvd. Suite 210
Lakewood, California 90712

The request must contain the API or specific gravity and flashpoint of the test medium and all of the following data:

1. Necessity to use a product other than water

2 Proposed product to be used for testing

3. Test pressure (% of SYMS)

4. Pressure test procedures, which, at a minimum, address the following:

   (a) Communication along the entire pipeline route.
   (b) Personnel stationed at sensitive areas.
   (c) Procedures to follow in the event of a leak.
   (d) Notification of local fire departments.

5. CSFM personnel will observe each test where possible.

CSFM will review the application and provide a written response to the pipeline operator. CSFM staff may observe the testing at any time.